Woodruff Scientific Inc

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Model number(s): M1-R-C
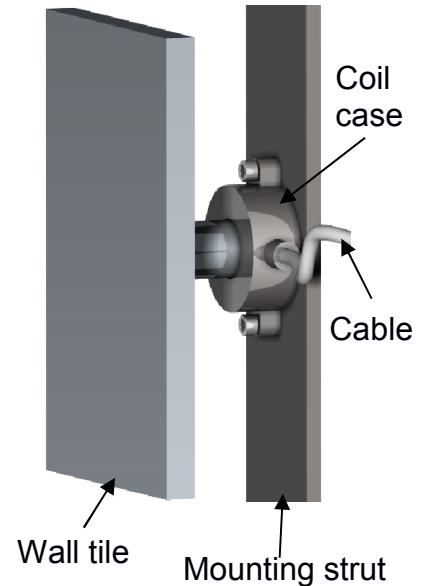**Descriptive name:** Rogowski Coil

Features:
- Measures the current passing through the coil
- Designed for ultra-high vacuum (UHV) compatibility
- Custom coil diameter and casing material
- Can be mounted behind wall tiles (right), around central column, diverter posts, and other locations
- Electrostatically shielded by thin-walled metal case for low capacitive noise and choked for common-mode isolation
- Includes custom integrator circuit
- Includes full calibration and transfer function characterization
- Can be mounted on a probe and inserted into plasma for current profile measurement (see M1-R-P spec sheet)

Operational ratings:
Max. current   : 50 kA
Max. frequency   : 1 MHz
Bandwidth   : 3 MHz
Min. major radius   : 1 cm (pictured above)

Options and customization:
Coil diameter: determines the spatial resolution or designed to fit around post
Casing material: stainless steel (standard, shown), molybdenum for high heat applications, or boron nitride if electrical isolation from mount is required
Mounting interface: can be customized to mount in many configurations
Split or slip-on coil: split coils can me mounted around posts already in place
Full or partial coil: an array of partial coils may be used to reconstruct plasma location or linked together to surround the entire cross-section of the plasma
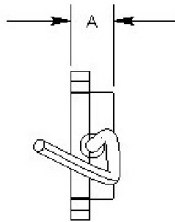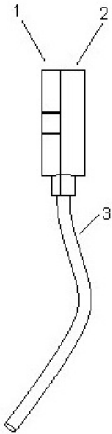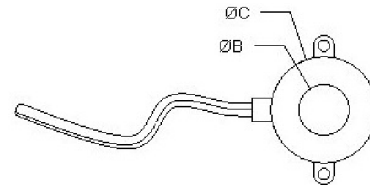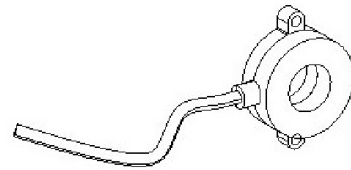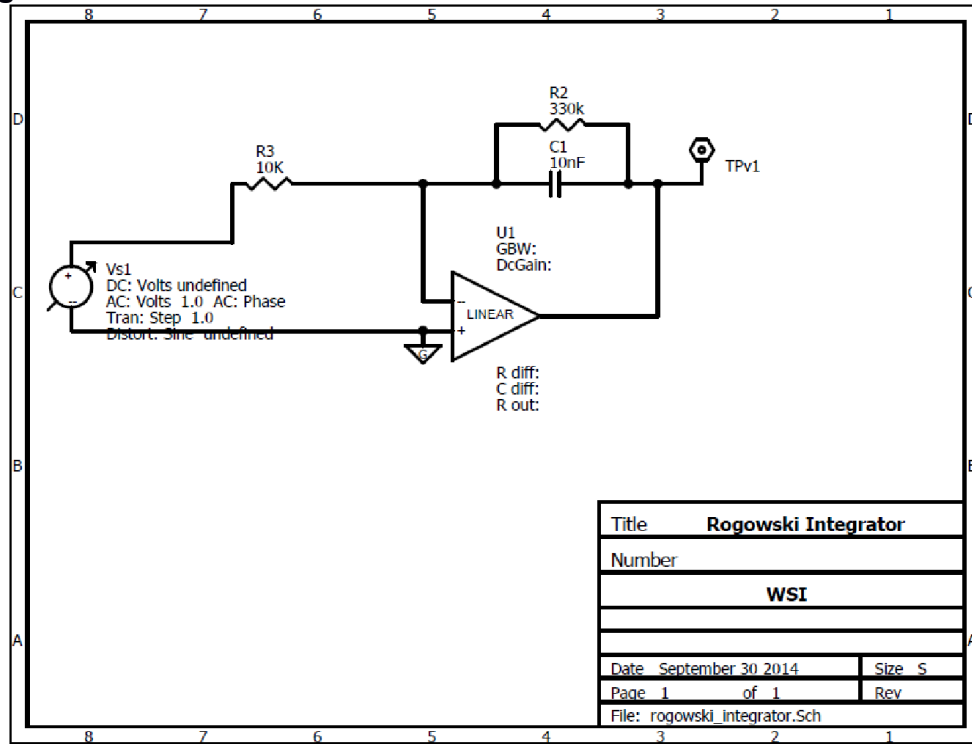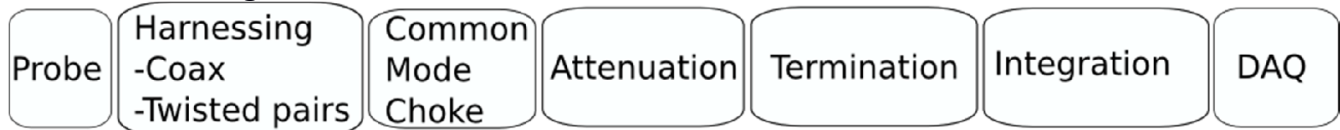
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Engineering drawing of probe configuration:

Notes:
- Drawing for informational purposes only, not to be used for manufacture
- Components:
  1. Coil case lower (M1-R-C-Case_lower)
  2. Coil case upper (M1-R-C-Case_upper)
  3. PTFE insulated Coaxial cable
  4. Alumina sleeve
  (Not visible) Stainless steel tube
  5. Coil casing
  (Not visible) Rogowski coil and form
- Dimensions A, B and C are custom, but values shown here are A = 8.5mm (0.332in), B = 1cm (0.394in), and C = 2.1cm (0.827in)

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M1-R-C

Rogowski Coil

Size	Drawing No.		Rev
A	0001		A

Scale				
1:1	CAD File		Sheet	1 of 1

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Signal integrator circuit:

Connection diagram:

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Data analysis:

Recovering the current from a Rogowski coil measurement (potential trace at right) involves multiplying the Fourier transform of the signal (shown at bottom left) with the response function of the device (shown at bottom right). This response function is determined during calibration and provided with the device. Taking the inverse Fourier transform of the result provides the measured current (shown at right).